POLICY BRIEF: ECOSYSTEM-BASED DISASTER RISK REDUCTION: DISTRICT-LEVEL COLLABORATION FOR FLOOD MITIGATION IN ACCRA, GHANA

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POLICY BRIEF

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Key messages

- Recurring / annual flooding in Accra has negative social and economic impacts, such as loss of property and livelihood.
- The ecosystem-based disaster risk reduction approach is one nature-based solution that can be used in addressing the flooding problem in Accra.
- The integration of infrastructure-based solutions and ecosystem-based solutions are necessary for effective flood management.
- Local experiences and information need to be incorporated into risk-profiling efforts, as well as innovative ways identified to enhance knowledge of national and local stakeholders.
- Municipal and district assemblies, as well as other relevant stakeholders, must collaborate in finding solutions to flooding.
- Engagement and coordination amongst municipal and district assemblies enables sharing of innovative approaches and lessons learned when problem-solving.
- A synchronised and coordinated approach is needed, given that the actions or inactions within one particular municipality affect neighbouring municipalities.
- Effective communication is important to ensure municipal and district assemblies work together.

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Ecosystem-based disaster risk reduction: District-level collaboration for flood mitigation in Accra, Ghana

At least one major flood disaster has occurred every year over the past 10 years in Accra. Some flood-prone parts of Accra even have names in local languages that translate to "big gutter" in English and local residents have historically avoided settling in these areas.

Population growth, urbanisation trends, rural-to-urban migration and climate change are among the leading causes of floods.[1] All these factors are complex, and their impacts are escalating. The current increase in flooding events in Accra can partly be attributed to poor drainage caused by the lack of or inadequate infrastructure. This is compounded by the underperformance of the few existing drains due to blockages from plastic waste and rubbish in gutters. Other factors include urban sprawl, which is leading to unplanned and unserved communities; construction in wetland areas; and the increased use of impermeable hard surfaces; all of which limit natural drainage. Lastly, an increase in extreme weather events as a result of climate change has resulted in more intense rainfall.[2]

There is, therefore, a clear need for the various municipal and district assemblies to better understand and effectively manage existing and future risks, and to liaise with other stakeholders to devise a roadmap on how to effectively manage flooding.

The ecosystem-based adaptation (EbA) approach can be used in finding a solution to the recurring flooding problems in Accra. EbA is a nature-based approach that uses biodiversity or ecosystem services to help people adapt to the adverse effects of climate change.[3]

An example is the practice of restoring a wetland habitat within a catchment area. Wetlands contribute to flood attenuation by storing water and absorbing excess flow from rivers or other water bodies that overflow. They assist with erosion control, which can decrease the silting up of waterways, while recharging groundwater.

Wetland plants are particularly good at controlling erosion by reducing stream energy and stabilising soil, allowing for better recovery of these systems after a damaging flood event. One such plant is vertiver grass, which helps to control erosion by forming a simple vegetative barrier (a hedge) made up of upright, rigid, dense and deeply-rooted clump grass that slows runoff, allowing sediments to stay on site and eventually form terraces. The vertiver grass is an

Image by C Gordon. Flooding in Christian Village, Accra.

Participants of the event on ecosystem-based disaster risk reduction of floods: Policy response strategies for Ghana, held at the Accra Metropolitan Authority as part of CCPOP 7 Conference, November 2019.

imported non-invasive plant which is used in Ghana for the various purposes mentioned above.[4]

There has been growing evidence of the effectiveness of EbA in addressing the challenges of climate change impacts, which include flooding. However, EbA approaches must be well understood for them to be adopted by national and local officials and embedded in the respective policies and laws.

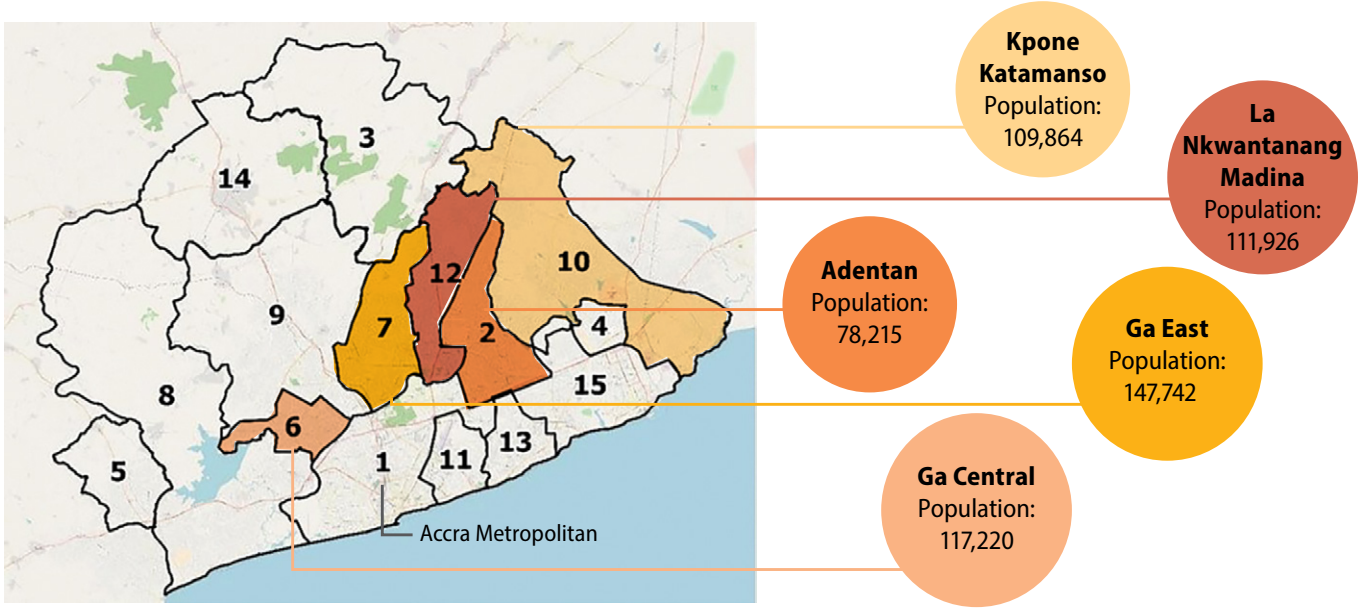
Studies show that EbA approaches can be cost effective and economically beneficial to societies and can serve as an optimal means of adapting to climate change. A case study in the Philippines showed that even though physical infrastructure is an acceptable solution for preventing coastal erosion, well-conserved mangroves were not only more cost effective, but their overall co-benefits far exceeded those of the seawall.[5] They not only increase resilience by providing storm protection, but more importantly, they positively impact people's livelihoods by providing other social and economic benefits. Therefore, in many cases and wherever appropriate, EbA measures can act as substitutes or complements to traditional protective methods.[6]

Collaborative solutions to flooding in Accra

Five assemblies in the Greater Accra Region were selected for a peer-to-peer learning event on flood management as part of the seventh Climate Change and Population (CCPOP 7) meeting in November 2019 (figure 1).[7]

The choice of municipalities was based on a series of studies undertaken since 2014 by PhD students from the Institute for Environment and Sanitation Studies (IESS), University of Ghana. The five assemblies were selected according to the following criteria:

Figure 1: Greater Accra Metropolitan Area (GAMA) administrative regions.[8]



- their exposure to floods
- whether the level of density in each area still allows space for nature-based solutions
- whether they share a number of waterways and drainage systems across their boundaries.

The municipal assemblies who participated were Ga East, Ga Central, La Nkwantanang Madina, Adentan, and Kpone Katamanso.

Common causes of flooding issues in five assemblies in Accra

Improper settlement location: Some buildings are positioned too close to rivers and drains, whilst others are built on waterways, which increases the risk of these settlements to flooding.

Improper drainage systems: Accra has many low-lying areas that experience severe recurrent flooding. This is due to inadequately sized culverts and blockages of major drains, which results from the accumulation of silt and waste.

Urbanisation: Increasing urbanisation and its related activities have negatively impacted the drainage systems in Accra. The development of residential buildings and paved roads has increased the impermeability of the catchment areas. This has given rise to less water being absorbed into groundwater plus faster water flow on hard surfaces and, consequently, larger volumes of runoff. Disregard for building regulations has also led to many settlements in Accra being built in the greenbelt zones of the city, subsequently depleting vegetation and making these areas more prone to erosion and flooding.[9]

Improper waste management practices: Some settlements in Accra are used as dumping sites for solid waste, which goes directly into watercourses, drains, culverts, and other drainage structures. This results in reduced drainage capacity and, thus, overflow that leads to flooding.

Lack of a synchronised and coordinated approach: There have been a number of cases where one district has carried out flood prevention by de-silting gutters without coordinating with the upstream or downstream districts, inevitably leading to wasted efforts and resources.

Current flood management measures in Accra

The National Disaster Management Organisation (NADMO), in collaboration with other departments from the Municipal and District Assemblies, are responsible for flood management within each municipality. For this reason, NADMO has units in every municipality to ensure that victims of flooding are assisted.

A National Flood Contingency Plan has been developed to help solve the flooding issue. There are Disaster Management Plans at the district, regional and national levels as well as a response team that can be reached on various emergency numbers. Other strategic measures in place are the Urban Search and Rescue Response Unit, the Emergency Operation Centre for Forecasting, which has the mandate to disseminate weather forecasts, and the Disaster Management Committee. An Inspectorate Unit has also been created to help with a roadmap for recurrent disasters in the country.

Even though NADMO has Disaster Management Plans for the municipal and district assemblies, there seems to be a disconnect between the national and local level NADMO offices. Hence, there needs to be communication and dissemination of these plans to the municipal and district assemblies to ensure that the right steps are taken. Also, it is necessary for the local officers to undergo regular training on the management plans established by NADMO.

Status of ecosystem-based adaptation (EbA) in Accra

Although EbA approaches are being used by some municipal and district assemblies in flood management, it has not been sufficiently adopted at the national policy level and is not being consistently implemented by those using it. Local technical capacity to implement EbA also needs to be developed to enhance the adoption of nature-based solutions in flood management. Collaboration and peer learning opportunities that are facilitated across government departments and local municipal and district assemblies can promote the adoption and implementation of EbA to enhance its effectiveness.

A key lesson from the CCPOP 7 meeting included the need for greater collaboration between neighbouring municipalities in finding solutions to the flooding in their respective areas.

"There is no communication within or between municipal assemblies. When one municipal assembly dredges its drains, the neighbouring communities are not informed and this creates problems in those communities. Therefore, there is a need to improve on communication seriously on the municipal level. Because one causes the problem and the other suffers." Mr Jeff Sena Johnson, La Nkwantanang Madina NADMO Officer.

Municipal and district assembly experiences and approaches to flood management

Most municipal and district assemblies rely on infrastructure-based adaptation options rather than EbA. This is partly due to a limited understanding of EbA's effectiveness and also a lack of capacity and funds to adequately implement the approaches. For example, approaches to flood management include:

Practical solutions: The five municipal and district assemblies have all found some solutions to the flooding problems in their areas. These include the building of culverts and stormwater drains in various hotspots; the education of citizens on how to responsibly dispose of waste and on how their actions impact and cause flooding; and, finally, the process of demolishing houses built on waterways.

Planning: Some assemblies have moved forward with planning. For example, the Ga Central Assembly stated that it has a five-phase strategic plan that includes: identifying the cause of floods, mapping flooding areas, and finding innovative solutions to the flooding issue. The assembly is also pursuing infrastructural solutions to flooding, such as building bridges.

"Apart from the mapping, we are also undergoing dredging and 10 major bridges are being built in the district. There was a registration process for all households so that their waste will be collected by service providers to reduce the sanitation issues in their communities." Dr Lamptey, Ga Central MCE.

Existing EbA approaches: Adentan Municipal Assembly has adopted some EbA approaches where they have planted vegetation on slopes to prevent erosion and around water bodies that serve as drainage systems for communities around them. The Municipal Assembly also intends to turn some ponds into fish farms for the economic benefit of the people living there. Adentan Municipal Assembly has also tasked all homeowners to plant at least three trees around their house. Without this requirement, building permits are not granted to homeowners.

Recommendations

- **Raising public awareness of preventive measures** to avoid flooding, such as not building on waterways and in wetlands, as well as avoiding the extraction of sand from beaches and dunes (sand winning).
- **Implementing effective drainage systems**, including mapping natural drainage sites in municipalities and protecting them from development. This is important for solving flood issues in most municipal and district assemblies in Accra.
- **Encouraging EbA approaches** even when infrastructure-based solutions are implemented.
- **Strictly enforcing building laws** to avoid building on waterways and in wetlands.
- **Municipal and district assemblies coming together** and collaborating to find solutions to flooding in their areas.
- **Facilitating the sharing of lessons** among municipal and district assemblies, which will enable innovative approaches and collective problem-solving.
- **Prioritising nature-based solutions in developing and implementing climate change policymaking**, as ecosystem-based adaptation often yields higher net benefits than conventional options. Afforestation, for example, can provide greater overall benefits by improving livelihoods and providing other social and economic benefits when trees of economic value are planted.

End notes

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About CDKN

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